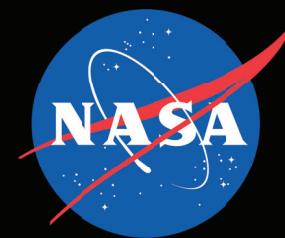




NASA Physical Sciences

Using the Light Microscopy Module (LMM) on the International Space Station (ISS) The Advanced Colloids Experiment (ACE) and MacroMolecular Biophysics (MMB)

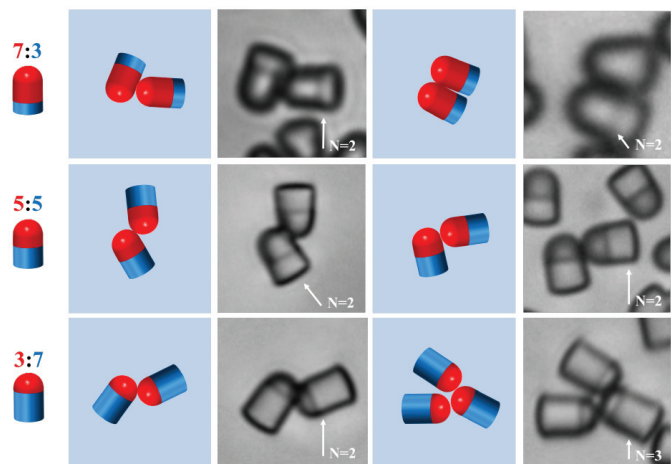


William Meyer,¹ Ronald Sicker,² Amber Abbott-Hearn,³ David Chao,² Fran Chiaramonte,⁴
¹USRA at NASA Glenn Research Center, ²NASA Glenn Research Center, ³ZIN Technologies, Inc., and ⁴NASA Headquarters

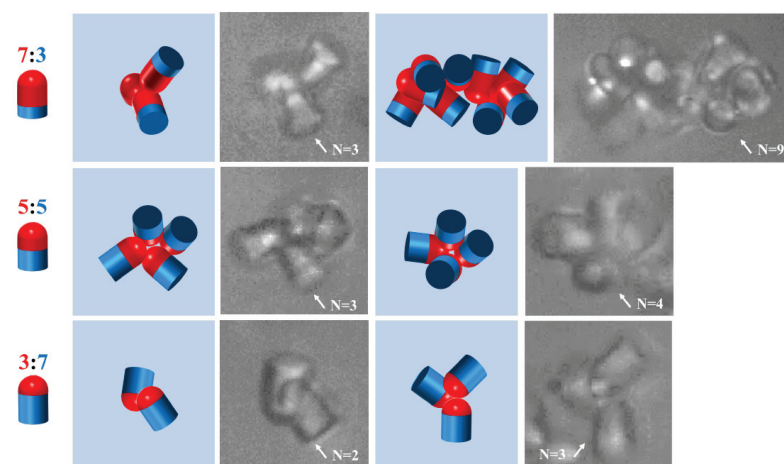
ACE-T1 (Chang-Soo Lee *et al.*)

Removing sedimentation, convection, and particle jamming by experimenting with Janus particles in microgravity enables new understanding and insights in both fundamental science and in colloidal engineering, important for deep-delivery of drugs and cosmetics.

2D Self-Assembly on Earth

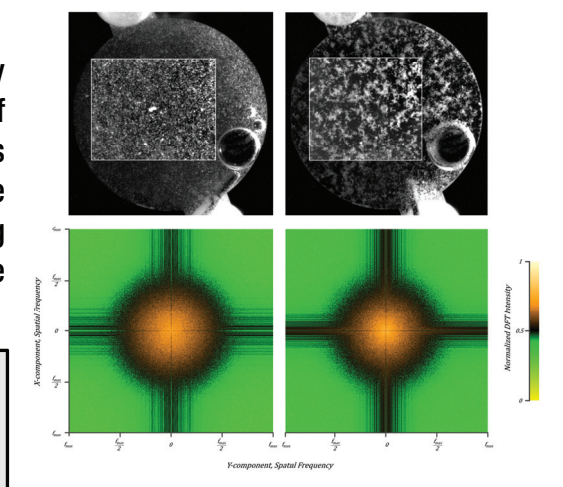


3D Self-Assembly in Microgravity



ACE-H2 (Stuart Williams *et al.*)

ACE-H2 is investigating the impact that charged nanoparticles have on the stability of a colloidal solution. The addition of nanoparticles may extend the shelf life of colloidal suspensions as well as enable their use in commercial applications (i.e., surface coatings). These images show two colloidal samples, one stable and the other unstable, at the end of the 6-week observation on the ISS along with their 2D discrete Fourier transform, a measure of pattern size and shape used to quantify the degree of aggregation among the colloids.



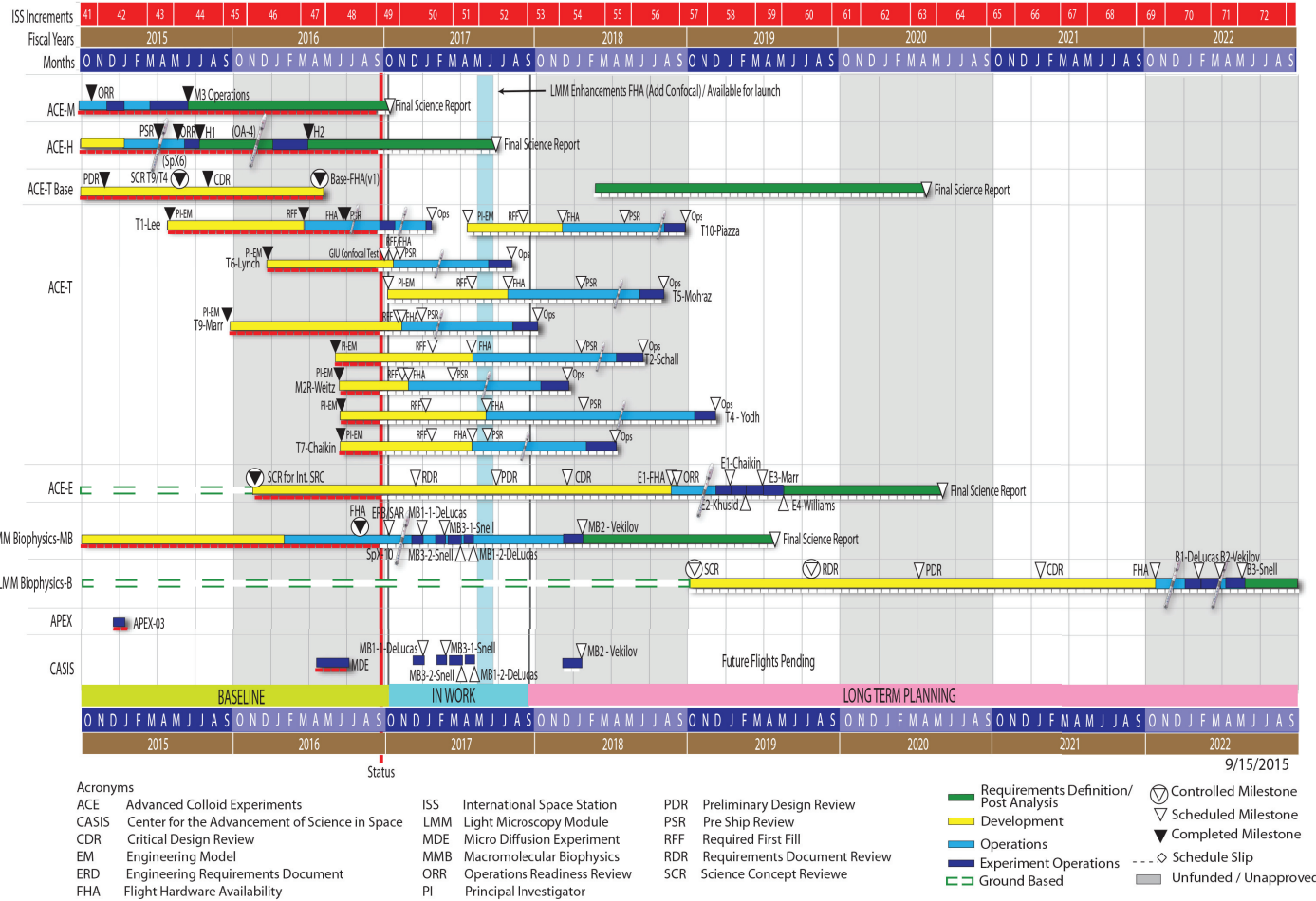
ACE Cell Launches

Cell	Science Team	Organization	Launch Date	Hardware Ready
M1	Lynch	P & G		
M2	Weitz	Harvard		
M3	Chaikin	NYU		
H1	Yodh	UPenn		
H2	Williams	UK		
T1	Lee	CNU	3/3/16	Mar-16
T9	Marr	CSM	11/16/16	Nov-16
MB1	DeLucas	UAB		Feb-16
MB3	Snell	HWMRI		Feb-16
Confocal Available				
T6	Lynch	P & G	11/16/16	Nov-16
M2	Weitz	Harvard	10/24/16	Nov-16
MB	Vekilov	UH		Nov-16
T7	Chaikin	NYU	2/8/17	Apr-17
T2	Schall	Uva	2/8/17	Apr-17
T4	Yodh	UPenn	2/8/17	May-17
T5	Mohraz	UC Irvine	5/10/17	Aug-17
T10	Piazza	Milan	8/24/17	Nov-17
E1	Chaikin	NYU		Sep-18
E2	Khusid	NJIT		Oct-18
E3	Marr	CSM		Oct-18
E4	Williams	UK		Oct-18
B1	DeLucas	UAB		2022
B2	Vekilov	UH		2022
B3	Snell	HWMRI		2022

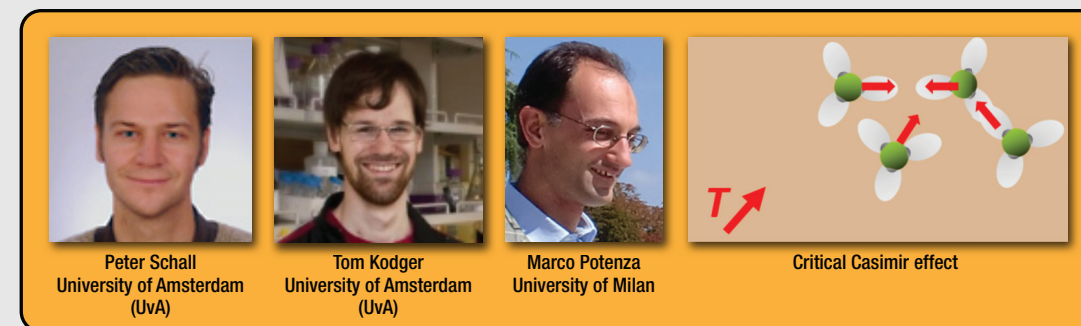
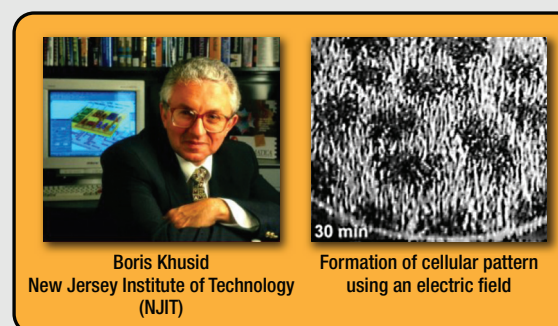
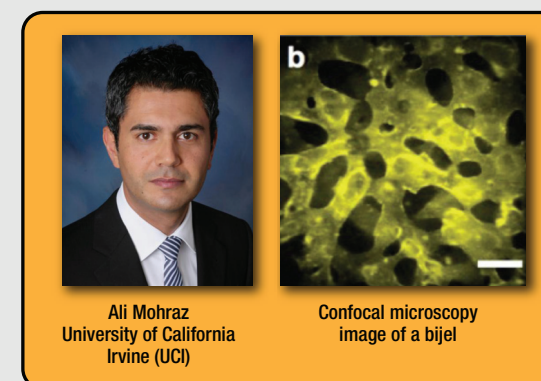
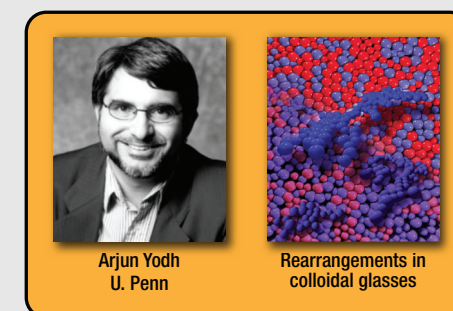
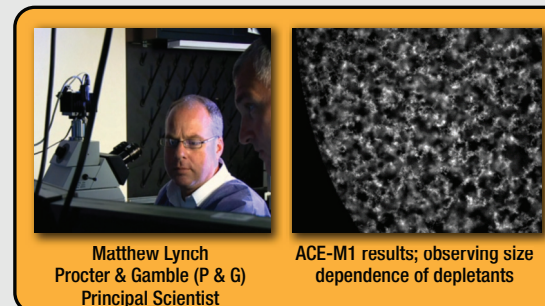
GRC ISS Physical Sciences Research Schedule

Complex Fluids, Macromolecular Biophysics, & CASIS

8-Year Milestone Schedule (FY15 - FY22)



ACE and MMB Science Teams, Mission, and Science Objectives (Pictured)



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